

Need for stricter control of residential areas waste disposal: a case of home-based *batik* production

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Abstract

Purpose: This study used *batik* production to explore the reasons underlying the government's "slow to non-existent action" on informal industry waste management. **Method:** We used case study and interviewed fifteen informants representing the business owners, workers, craftsmen groups, and local government institutions. **Results:** Chemical waste from the *batik* making process was disposed of around residential areas. The workers had no attention as to whether the chemical wastes in their environment harm their environment and health in the future. Overseeing unit, used to be at the district level, was delegated to the one at the sub-district level, which made local officer less independent when dealing with income interests of their people and weakened public health protection to the people. **Conclusion:** Study was consistent with "no action" argument that is in favor of income opportunity and put health concern as low priority. Public health officials should find ways to advocate stronger waste disposal regulation in small scale industries should be in place, in particular, when people living around the small scale industry watch the damages to their surrounding environment.

Keywords: safety practice; environmental literacy; *batik* waste disposal; small scale *batik* industry

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INTRODUCTION

Occupational health professionals and the extraordinary environment care about the growth of small industries in many countries, especially in developing countries [1,2]. They are worried that growth makes workers actually have a bad impact. SMEs are known to have a low commitment to environmental management practices [3,4]. The focus of development programs designed by the government and NGOs is often separated between aspects of economic development and health in the workplace [2],

including their social security [5]. Therefore, occupational health and environmental experts actively advocate for small industries to be positive for public health [6].

In Indonesia, household economic opportunities in the field of *batik* craft are growing rapidly. In 2009, UNESCO assigned Indonesia *Batik* as an intangible cultural heritage of humanity. Furthermore, Yogyakarta has also been declared a World Craft City for *Batik* by the World Craft Council in 2014. In increasing regional economic revenues, the government has been intensely promoting *batik* as a

superior product in Bantul district, and was determined by the Bantul Regent Decree No. 489 of 2014 about regional superior products. There are 619 *batik* business units in the household scale, small and medium industries involving 2239 workers [7].

On the other hand, the *batik* industry causes various problems, especially in the field of environmental health [8]. Waste resulting from the process of *batik* making with natural and synthetic dyes and the process of melodizing and *batik* with caustic soda and Sodium Silicate (Na_2SiO_3) will have an impact on the environment [9,10]. Previous research has stated that *batik* wastewater discharged into rivers contains chromium (Cr) and copper (Cu). The process of dyeing or coloring using the help of diazinon salt will increase the level of Total Suspended Solid (TSS) 4730 mg/L and Total Dissolved Solid (TDS) 18,260 mg/L in the waste. At the production site, river water with a high density of *batik* industry was found to cause an increase in river water temperature, TDS and TSS levels [11].

Yogyakarta Province Decree No 7 the Year 2016 mentioned that business owners must meet wastewater quality standards. Government has the functions of fostering and supervising productions. Communities serve as watchdogs in reporting violations and advise the government and local institutions. Nevertheless, the presence of a regulation cannot adequately translate to good practice without the full participation of all the parties involved. Previous studies have reported weak enforcement from the local government [7]. There is also lack of initiative from the affected society to report violations in the informal industry as the community tends to have low perception, knowledge, awareness, and attitude toward the impact of environmental hazards [12].

Although much effort has been made to address a healthier workplace and safe environment, a few studies documented progress in waste-related behavior of *batik* artisans [7]. This study explored the management and disposal of hazardous substances in the *batik* industry in Yogyakarta Special Region Province, the awareness among community stakeholders to prevent environmental pollution, and opportunities to strengthen supervision at the level of government regulatory agencies primarily district health office and industrial and trade office.

METHOD

This qualitative study interviewed 15 respondents, consisting workers, business owners and local government agencies in Bantul Regency. Purposive

sampling conducted with consideration of the person mastered or understood, and still or was interacting with the field to be studied; who had sufficient time to be asked for information; and people who were quite foreign to the researcher. The study was conducted in March-May 2017. Informants came from the IKM *Batik* Giriloyo center in Wukirsari village, Imogiri district, and Bantul district. The research was conducted by interview, observation and document review.

RESULTS

Waste from *batik* making

Changes in the process of making *batik* from the use of natural dyes to synthetic materials produce waste that falls into the B3 waste category. Understanding business owners of *batik* waste is quite good, but *batik* waste management has not been following the standards set. Disposal of used laundry water and rinsing after staining were carried out without any processing.

"...if here, it is still one with the disposal of the bathroom, there is no waste treatment. The group is proposing to manufacture waste treatment but there is no land yet, because the land is still problematic ..." PU1

"... thrown into a well ... yes I don't really understand, bro ... I only know that waste can cause environmental pollution..." PU2

"...there is disposal of the waste, but yes because of chemicals, yes, the chemicals are still, the waste used for washing stains is thrown into ordinary wells, because it is not dangerous, because the shape is like used water. But if the rest of the coloring is discharged into the waste well ..." PU3

"...he dumped it here, there was a well, there was a channel to the waste well, made by an NGO. If the former laundry is okay, it's not too disturbing to the environment. If the rest of the color is just thrown into a separate well, sometimes it is normal to throw it into a drain, like water used to wash clothes ..." PU4

"... there used to be a... Well, if I am not mistaken there are 3 wells, about 3 meters deep. Made by NGOs, it is possible that each group already has a waste disposal well, so it can cause environmental pollution. If you use natural colors it's okay, you can fertilize it, because there is Java sugar, natural indigo, and chalk." PR1

Regulation of Household Waste Management

The policy of *batik* waste management still refers to the general waste management policy in Bantul (Bantul

Regency Regional Regulation No 15 or 2010 concerning Waste Water Management). Although the local government knows about the impact of the disposal of batik industry waste, there are still problems in its management.

“If the waste is sometimes (silent) ... we don't budget waste ... right? We already have friends from the Environment Office, we process it if there is coordination with us, for example, we have this activity. -there is batik ... like this, we are going there, not only in Giriloyo, the rough language is there but it hasn't entered the well of clean water, but it is possible to get rainwater runoff into the well ...” I1

“... there is a policy of pollution, if I don't know exactly. There might be a policy on waste disposal, the impact is ... there are many farmers who complain, because of the waste in the irrigation, I happened to be in DSDA which took care of the farmers to know. But this waste is not from Giriloyo, but from other centers ...” I2

“For batik waste including waste management, waste management also exists but the scope of the company, if it is informal ... This is the difficulty ... the difficulties are spread, batik waste management policies ... unwritten policies in the community. Not available. Immediately there is a regent regulation if it is specific like this..” I3

“Batik waste management, it has been practiced, is just the implementation, if the policy already exists ...” I4

“..there is already a waste processing demonstration tool, some of the tools we have provided, in Pandak and Giriloyo, evaluations are carried out, some are used, some are not, their understanding is still low, we don't have a special model. We are just starting to get there, going forward, later we want to do research first, what is the waste, how is the management model, which models can be given to the community, for example for the management of waste ...” I5

Constraints on Batik Waste Management

Spread production locations. Crafters work in one place in a production house that has been provided by the waste-making system.

“There is also a production house. They did not want to use the production house in Karang Kulon, which had already been processing the waste because it was far from their homes. Even if there is a production house, the waste is centralized, they can work together there, the waste management is better, that is assistance from NGOs“ I5.

The low understanding of *batik* business owners about the chemical content in *batik* waste causes them to waste without prior processing. Lack of information about *batik* waste is influenced by the lack of literacy about occupational safety and health.

The responsibility of the business owner

Initially the process of coloring *batik*, the Giriloyo batik center uses natural dyes that are environmentally friendly. But along with its development and consumer demand, the dyes used are switched to synthetic dyes. This reality causes waste that is not environmentally friendly anymore; so management must be carried out against the waste. Disposal of waste can directly affect the condition of existing water sources, cadmium content in wells is influenced by cadmium levels in rivers, and porosity level and distance between rivers and wells [13].

In the Giriloyo region, the majority of the people use wells to meet the needs of drinking water and clean water which shows that batik waste treatment is urgently needed. The policy used in waste management has not been specifically addressing batik waste, but is still macro. Through the relevant offices, the local government has provided assistance for simple (small-scale) waste treatment equipment, but the equipment is not optimally used; even some equipment is not used at all. They argue that the amount of staining waste is few, so it is troublesome to use the tool. Like the following informant statement:

“isn't the amount of waste just a little, bro, so it's troublesome if you have to enter it there, the coloring will be done again tomorrow..”PU3

One interesting thing about the understanding of business owners about batik waste is that, what is dangerous is the rest of the coloring material itself, while the used water / rinse used during the coloring process for them is harmless, just like used clothes washing water (in figure 3).

“The used washing waste staining is disposed of in ordinary wells, because it is not dangerous, it is like washing water. But if the rest of the coloring is disposed of in the waste well” PU3

“The used laundry is okay, not so disturbing to the environment. If the remaining color is discarded in the

well. There is a separate well, sometimes it is thrown in a ditch, it is normal, it is like plain cloth used water” P4

Pinget's study relating to environmental management shows that businesses that delay the implementation of environmental management are usually more concerned with economic risk, lack of personnel, less responsive consumers, and lack of information about rigid technology and organizations [14]. Although business owners know that there are environmental and health impacts due to waste disposal without processing but in practice they still do not care about their own environmental and health issues [15].

Another study also stated that the environmental management system in small and medium enterprises depends on age, consumers and the concern of business owners [16]. Consumers who prefer batik with synthetic dyes cause craftsmen to prefer to use non-environmentally friendly dyes. Besides, because the coloring process with synthetic materials is easier than natural dyes, and the fear of price competition makes craftsmen reluctant to include the cost of waste management.

“Sometimes, if I meet entrepreneurs or craftsmen, to enter the processing costs it is financed by production and they do not enter, so when there is a cost for processing the waste is there ... they are not interested there ... because they will increase product prices so they are afraid of price competition..”I1

Business owners

Although they have the desire to manage communal waste, business owners have problems in determining waste processing locations while their businesses are widespread in the population. [15] :

“The group is applying for the manufacture of waste treatment but there is no land, still having problems with the land for the place. because it's located far away, so it's still confused where it is placed.”PU1

The Batik IKM Licensing Process

The findings in the field indicate that the existing business permit is still limited to the certificate issued by the sub-district. This is in accordance with the Regulations of the Regent of Bantul No. 81 of 2015 concerning the Delegation of Licensing Authority of Small and Medium Enterprises, in article 10 paragraph 1 of the letter mentioned about the contents / requirements for managing IUMK, one of which is the

need for environmental management documents, if the business has a significant environmental impact. In one of the business owner informants who already had an IUMK, it was found that when the management did not need to attach documents about environmental management, such statements were as follows:

“if we take care of it in the sub-district, the conditions are only KTP, KK, photos, then signatures from neighbors left and right. There are no documents regarding environmental management. If you use the document if you take care of the SIUP” PU1.

Small and medium-sized industries should continue to carry out the preparation of environmental management and monitoring capability documents (SPPL) with approval from the relevant agencies. The policy was prepared with the aim of helping small and medium enterprises to progress, by facilitating or bringing the licensing process closer to small and medium enterprises, but indirectly can have environmental implications.

DISCUSSION

Seharusnya ini dimulai dengan perilaku pembatik. Tetapi karena mereka akan mengikuti jika business owner memiliki aturan yang harus ditetapkan terkait proses pembuatan batik. Business owner adalah yang berhak menyalurkan batik ke pihak lain dan mereka berurusan langsung dengan ijin perdagangan. Business owner harus mengajari buruh untuk bisa bekerja untuk mereka dengan baik. Business owner bisa membantu dan mendiskusikan peran mereka dalam pengelolaan limbah. Karena itu pola penting dalam sistem ini, harus ada business owners yang diminta tanggung jawab atas kerusakan lingkungan akibat kegiatan itu.

Adapun penguatan regulasi dapat ditempuh dengan cara langkah demi langkah mulai dari aturan yang sederhana.

Batik making is carried out on a household scale, the production process is carried out around the house. The impact of doing work at home is to remove risk factors in the home environment, and the loss of domestic space in the house so that preventive measures must be taken against pollution around the home environment because it usually has poor environmental conditions. [8,17,18]. In addition, irregular work activities are usually untouched by

service personnel, especially with regard to the safety and health issues of workers and family members (especially children) [17,18].

Stakeholders involvement in managing IKM Batik

Management of Batik IKM involves many parties, namely the Health Office, the Office of Industry, Trade and Cooperatives, Puskesmas, the Environmental Service, Bappeda. Each stakeholder has the authority and responsibility in accordance with the main tasks and functions.

Table 1. Stakeholders in managing IKM Batik

Stakeholders and issue framing
<p>District mayor make policies on the informal sector (UKK post) policy in handwritten batik as a regional competitive product</p>
<p>District Planning Body One village one product is a priority but limited coordination with others on related problems.</p>
<p>Industria, trade, and cooperative district office the leading sector for the development of competitiveness of local "handwritten batik" products is more focused on</p>
<p>District health office to improve the literacy of informal sector workers to monitor the quality of clean water to manage district level UKK posts</p>
<p>District environmental office To facilitate the improvement of batik waste management</p>
<p>Subdistrict office permit for IUMK</p>
<p>Puskesmas occupational health coordinator Technical supervision of batik workers (UKK post), documentation of PAK and KK</p>
<p>Batik Owners Association Manage batik craftsmen especially for marketing the final product</p>
<p>Batik makers Literacy and Concern related to OSH and Environmental issues</p>
<p>Village head I already know for sure that batik artisans disposed of waste elsewhere without treatment. Despite its risk to the environment, I was reluctant to reprimand because community sole income comes from batik making.</p>
<p>Neighbourhood community members</p>

Occupational health coordinator in the study puskesmas is a midwife who has aside assignment as coordinator for occupational health supervision for the informal workers in their area. They are still

hesitant to make activities to protect the community because they focus on the primary role in paramedical jobs in the puskesmas. They finally got caught up in the health check-up activities of the workers in the puskesmas, which were actually not the main goal

Safety and health efforts in the puskesmas run if workers have experienced health problems, which contradict the principles of safety and health management based on promotive and preventive efforts. The UKK post remains to focus on health examination rather than health education. Also, capacity building activities of business owners and workers through education and training are only carried out a straightforward socialization meeting once a year even though it has involved medical, nutrition, and environmental health workers, and health promotion.

With the willingness of the business owners / groups, it should be able to be followed up by the government in managing integrated batik waste, through organizing various fields so that they can immediately realize ideas in the community. [19]. Management of batik waste is one aspect of managing the work environment, so it can create a healthy work environment [20].

Business owners and batik workers have low occupational health literacy. They get limited health promotion, which determines low occupational health literacy for workers [21–23]. Productivity can increase if occupational health literacy, workers' health and welfare status increases. Literacy is especially important so that the community can understand the impact of the work process or its work on health so that it can lead to an understanding of special risks, reduce exposure and have an impact on improving individual and community health conditions ([24,25].

Although most activities of the health workers in Indonesia work for the maternal and child health and nutrition issues, sub-district officials can work hand in hand to promote workers participation. For example, domestic workers can be appointed as cadres and invite their friends to care about the workplace environment [26].

Studies have shown the importance of participation from civil society in government programs [27–29]. News in the newspaper often shows protests of residents against environmental problems that report danger situations from a small or large industry in their community. Although they are usually defeated because companies and local officials place the economy higher than health, the courage of the local

population needs attention from larger NGOs who usually work to help them. Supporters of the public health interests need to continue to get a good understanding of environmental literacy that is extraordinarily important if it is supported by all local residents. Only with pressure from civil society like this will the local government gradually improve the local environmental management system [30].

CONCLUSION

This study shows the case about the growth of opportunities for family income in weak populations and the need for effective environmental management

around batik artisans. The lack of waste treatment management from the batik making process at the business owner's side have an impact on environmental pollution. Provincial-level officers should consider retaking the inspection role currently under sub-district officers. Loosed and permissive inspection towards local batik makers will result in tolerance to irresponsible waste behavior among batik artisans. The district government should back up their officers to not hesitate to warn and to take firm action against batik artisans and business owners who expose risks to the local population.

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